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Attorney Docket 040301/0578

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Nobutoshi AOKI et al.  
Title: SEMICONDUCTOR INTEGRATED CIRCUIT INCLUDING  
INSULATED GATE FIELD EFFECT TRANSISTOR AND METHOD  
OF MANUFACTURING THE SAME  
Appl. No.: 09/440,928  
Filing Date: November 16, 1999  
Examiner: S. Rao  
Art Unit: 2814

22# / INS  
11/24/03  
nlbm

**INFORMATION DISCLOSURE STATEMENT  
UNDER 37 C.F.R. § 1.56 AND § 1.97**

Mail Stop NON-FEE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Sir:

Submitted herewith on a modified Form SB/08 is a listing of documents known to applicants in order to comply with applicants' duty of disclosure pursuant to 37 CFR §1.56. Copies of the listed documents are being submitted to comply with the provisions of 37 CFR §1.97-1.98.

The submission of such a document herewith, which is not a statutory bar, is not intended as an admission that such document constitutes prior art against the claims of the present application or that such document is considered material to patentability as defined in 37 CFR §1.56(b). Applicants do not waive any rights to take any action which would be appropriate to antedate or otherwise remove as a competent reference any document which is determined to be a *prima facie* prior art reference against the claims of the present application.

**Match and Return**

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**TIMING OF THE DISCLOSURE AND FEE**

The instant Information Disclosure Statement is being filed in compliance with 37 C.F.R. § 1.97(c) prior to the mailing date of either a final action or a notice of allowance. Accordingly, pursuant to 37 CFR §1.97(c), a statement or fee is required. The statement under 37 CFR § 1.97(e)(1) is provided below.

**STATEMENT**

The undersigned hereby states in accordance with 37 C.F.R. § 1.97(e)(1) that each item of information contained in this Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three (3) months prior to the filing of this Information Disclosure Statement.

**CONCISE EXPLANATION OF RELEVANCE**

Documents A5-A10 were cited in a Japanese office action during prosecution of a counterpart Japanese application. Documents A5-A10 are in Japanese.

The relevance of documents A5-A10 is based on the following partial translation of the Japanese Office Action:

**Reasons**

1. The invention of the below claims of the subject application should not be granted a patent under the provision of Patent Law Section 29 (1) 3 since it has been cited in the below-noted publications distributed in Japan or other countries prior to the filing of the subject application.
2. The invention of the below claims of the subject application should not be granted a patent under the provision of Patent Law Section 29 (2) since it could have been easily made by a person skilled in the art based on the inventions cited in the below-noted publications which had been distributed in Japan or other countries prior to the filing of the subject application.
3. The invention of the below claims of the subject application should not be granted a patent under the provision of Patent Law Section 29 (2) since it is identical with an invention described in the specification or drawings originally attached to the request of the below-noted patent application, which was filed prior to the filing

date of the subject application and was later published.  
Furthermore, the inventor of the subject application is not the same as the inventor who made the said invention and the applicant of the subject application at the time of filing the subject application is also not the same as the applicant of said application.

4. The subject application does not comply with the requirements under Patent Law Section 36 (4).

5. The subject application does not comply with the requirements under Patent Law Section 36 (6) 2.

6. The subject application does not comply with the requirements under Patent Law Section 37.

Reasons 1 and 2

[Claims 1-11, 12-14, 15-21, 22, 23-25]

Reasons 1 and 2

References: 1, 2, 3, 4, 5

(Note)

Refer to Reference 1 (The entire text is relevant but particularly the description re Embodiment 3 and 4). Reference 1 discloses the invention using the material including Ge (obviously including SiGe) for both gate electrode and source drain electrode and Si for the locations to be silicified.

It is publicly known, as disclosed in References 2 (Refer to the working examples.) and 3 (Especially description of Fig. 4), to have SiGe as the lowest layer portion of the gate electrode.

Furthermore, the layer structure and the composition ratio profile can be appropriately determined by a person skilled in the art, taking into the account the element's characteristics of the final product, process conditions, etc. (Should be continuous using ion injection, step-by-step using film formation method.)

References 4 (especially Embodiment 7) and 5 (description re Figs 15-19 although selective description) discloses the technology silicifying the upper layer when SiGe and Si are laminated in that order as a manufacturing method.

Reason 3

[Claims 4-11, 12, 25]

Reason: 3

Reference 6

(Note)

Refer to the description of the third embodiment of Specification 6.

#### Reason 4

[Precise explanation of invention]

Reason: 4

The scope of the claims of the subject application includes references to "1<sup>st</sup> Group-Four-Element" "2<sup>nd</sup> Group-Four-Element" and Si, Ge and C are included therein respectively. However, the precise explanation of invention or the drawings only provide the examples using Si as "1<sup>st</sup> Group-Four-Element" and Ge as "2<sup>nd</sup> Group-Four-Element", and does not discuss other combinations of elements.

If the structure, manufacture method and the effects can be easily anticipated from the above-mentioned examples, it is not a concern. However, as the subject application explains in [Issues to be solved by this invention], the invention of the subject application is only valid using Si as "1<sup>st</sup> Group-Four-Element" and Ge as "2<sup>nd</sup> Group-Four-Element", and the results in the case where the substitutes are used cannot be estimated.

Therefore the precise explanation of this invention does not describe other combinations than Si and Ge as "1<sup>st</sup> Group-Four-Element" and "2<sup>nd</sup> Group-Four-Element" respectively for a person skilled in the art to carry out.

#### Reason 5

[Claims 1-25]

Reason 5

The scope of Claims 1-4, 10-16, 21-25 includes the combination of "1<sup>st</sup> Group-Four-Element" and "2<sup>nd</sup> Group-Four-Element", of which the effect is not convincing, if literally interpreted. However, since it is not clear if such a combination is included in the scope of patent claims, the scope of the invention is unclear (Refer to Reason 4).

"Gate insulating film side" referred to in Claim 1 of the subject application, by such description itself, does not clearly identify which portion of the gate electrode it should be. (It is

generally believed to be the part which is in contact with the gate insulating film, as can be understood by other descriptions of Claim 1, but Claim 25 may indicate otherwise. Then, it is possible that "2<sup>nd</sup> Domain" could be further away from the gate insulating film than "1<sup>st</sup> Domain" in Claim 1.) The same can be said for other claims with the similar description.

Claim 4 uses a term, "substantially", but it is not clear how much is within the scope. The scope of the invention is, therefore, unclear. The same can be said for other claims using the same similar description.

#### Reason 6

##### Reason: 6

Claims 1-25 of the subject application, with issues to be solved and main elements of invention considered, do not satisfy the unity of invention. The issues to be solved contain a phrase, "using SiGe as electrode but the Silicide electrode does not contain Ge", however, Claims 1-3 do not have Silicide structure. Furthermore, the above-mentioned issues themselves are cited in Reference 1. Considering the main elements of the invention, the invention cannot be united since it includes claims which do not require Silicide and claims which are not related to one another because of gate electrodes and source drain electrodes (could be related in a bigger concept, but since it does not evade prior art, the main elements need to be further limited.).

#### References

1. JP 10-163130
2. JP 10-027854
3. JP 05-235335
4. JP 05-183160
5. JP 06-077246
6. Japanese Application No. 09-156211 (JP 11-003999)

The statements in the Japanese office action are based on a translation that applicants' representative obtained. These statements should in no way be considered as an agreement by applicants with, or an admission of, what is asserted in the Japanese office action.

English language translations of documents A5-A10 are not readily available; however, English language abstracts are provided herewith. The absence of such translations

does not relieve the PTO from its duty to consider the submitted documents (37 CFR §1.98 and M.P.E.P. § 609).

Applicants respectfully request that the listed documents be considered by the Examiner and formally be made of record in the present application and that an initialed copy of Form SB/08 be returned in accordance with MPEP §609.

Respectfully submitted,

Date June 25, 2003

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Should additional fees be necessary in connection with the filing of this paper, or if a petition for extension of time is required for timely acceptance of same, the Commissioner is hereby authorized to charge deposit account No. 19-0741 for any such fees; and applicants hereby petition for any needed extension of time.

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Substitute for form 1449B/PTO <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> Date Submitted: June 25, 2003 (Use as many sheets as necessary)		<b>Complete if Known</b>	
Application Number		09/440,928	
Filing Date		11/16/1999	
First Named Inventor		Nobutoshi AOKI et al.	
Group Art Unit		2814	
Examiner Name		S. Rao	
Attorney Docket Number		040301-0578	

## U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code <sup>2</sup> (if known)			

## FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Name of Patentee or Applicant of Cited Documents	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Office <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)				
	A5	JP	10-163130		TOSHIAKI	06/19/1998		
	A6	JP	10-027854		NAOKI	01/27/1998		
	A7	JP	05-235335		MITSURU	10/09/1993		
	A8	JP	05-183160		AKIRA et al.	07/23/1993		
	A9	JP	06-077246		MOSLEHI	03/18/1994		
	A10	JP	11-003999		TAKASHI	01/06/1999		

## NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>6</sup>

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<sup>1</sup> Unique citation designation number. <sup>2</sup> See attached Kinds of U.S. Patent Documents. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.

<sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

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